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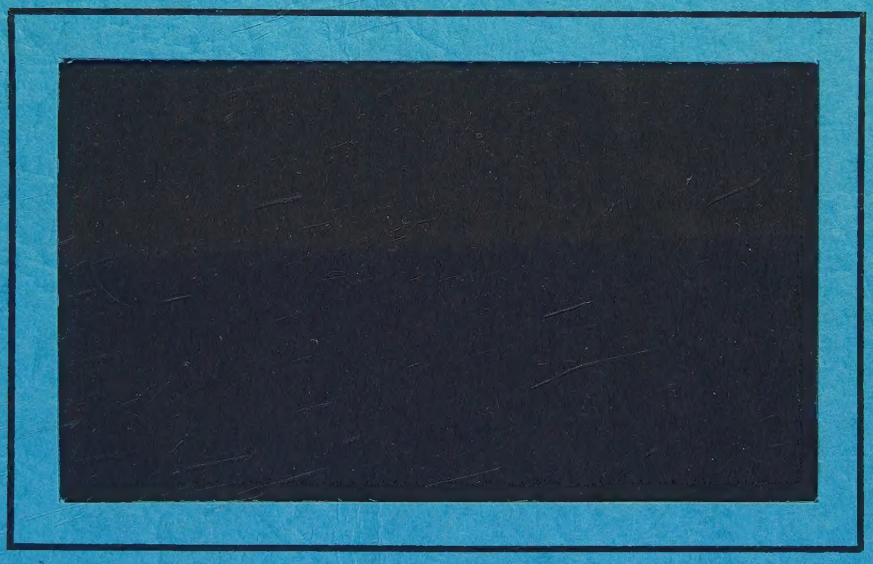

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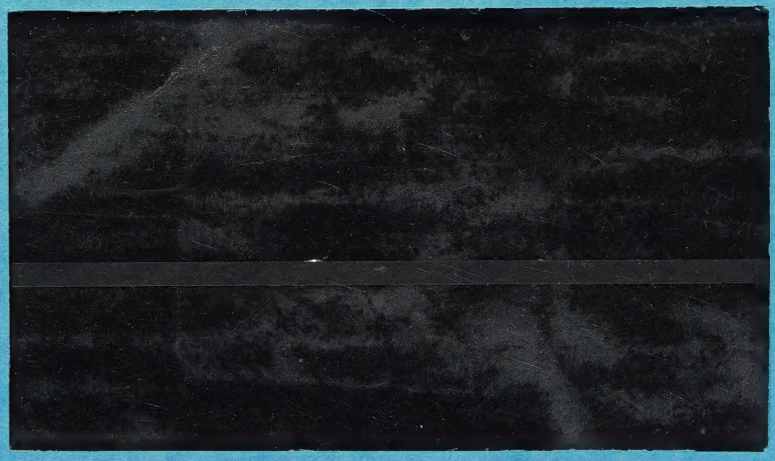


WOODS HOLE OCEANOGRAPHIC INSTITUTION

Woods Hole, Massachusetts

Reference No.50-19

OCEANIC BIOLOGY
(Oceanographic Research)

C. J. Fish, SUPERVISOR

January 1, 1950 - March 31, 1950

Periodic Status Report
Office of Naval Research
Contract N6-ori-195/TO 1/NR-083-003

April 1950

APPROVED FOR DISTRIBUTION Alfred C. Redfield
Associate Director

ABSTRACT

Physical and biological analyses of summer sonic fish recordings and data are being continued. In March satisfactory recordings were obtained on 18 specimens of the winter sculpin Myoxocephalus octodecimspinosus. Anatomical studies are also being made of this and other sonic species used in the experiments for age, sex, gonad development and structure of the sound-producing mechanisms. Seven sets of field equipment for the U. S. weather station plankton program at Stations Baker and Easy have been assembled. Weekly observations began at Station Easy on 15 February and at Station Baker on 25 February. To date plankton samples with accompanying records have been received from three of the vessels. The bibliographic card index of Pacific oceanography is being maintained up to date and expanded to include the Atlantic and Arctic.

Subj: The Oceanic Biology Project

Encl: (A) Plankton log sheet
(B) Phosphorescence log sheet

RESEARCH

1. Sonic Fish program. All field and laboratory data and recordings obtained to date on local sonic fishes have been organized, analyzed and compared by Marie P. Fish, with a view to determining the nature of the response in each species to different types of controlled stimulation, and the relative significance of the various forms as sound producers. Because the frequent and continued use of this ability, especially in large aggregations of schooling fishes, may be more important than the intensity of the sounds produced by solitary individuals, particular attention has also been given to the life habits of each species. Based on these biological analyses, plans have been completed for field observations during spring and summer in locations and at times when congregations occur. For this study a portable field recording unit will be needed.

2. The first group included in the above schedule is the Family Cottidae, the sculpins, for which there have been no previous sound recordings. During March a large number of the winter resident Myoxocephalus octodecimspinosus Mitchill were subjected to the same series of controlled stimulation experiments used on the summer fauna, and satisfactory recordings of 18 specimens representing different sexes and age groups were obtained. Although the individual output was found to be quite small in comparison with some of the other sonic fishes, the fact that sculpins occur in excessive numbers throughout their range, especially in far northern Atlantic and Pacific waters, warrants their inclusion among the significant marine noisemakers. Producing a guttural growl of about 45 cps, their concerted sound has the quality of mechanical noise, resembling somewhat the hum of a dynamo.

3. Physical analyses of the sounds by Alton S. Kelsey, Jr. has been continued at Brown University under the supervision of Mrs. Fish. All disc records made to date have been classified in the order of their relative clarity and fidelity, and the best records for each species run through the harmonic wave analyzer to secure noise frequency spectra. Oscillograms of these will later be obtained with a G. E. Recording Oscillograph. The daily, continuous Esterline-Angus summer recordings are being tabulated for frequency of output and apparent sound patterns.

4. Weathership plankton program. In preparation for the institution of field investigations described in the previous quarterly report, seven sets of equipment have been assembled and a Manual of Instructions compiled. Each set consists of three wooden shipping cases containing the following items:

INSTRUMENT CASE

1 Nansen Reversing Water Bottle
2 Nansen Bottle messengers
1 Clarke-Bumpus Plankton Sampler
2 C-B plankton nets of No.2 silk bolting cloth
2 C-B plankton nets of No.12 silk bolting cloth
2 Standard half-meter plankton nets of No.2 silk bolting cloth with brass net rings.
1 Inclinometer
1 Secchi Disc (white)
Marking tags, labels, cloth tape and pipette with rubber bulb

SUPPLY CASE

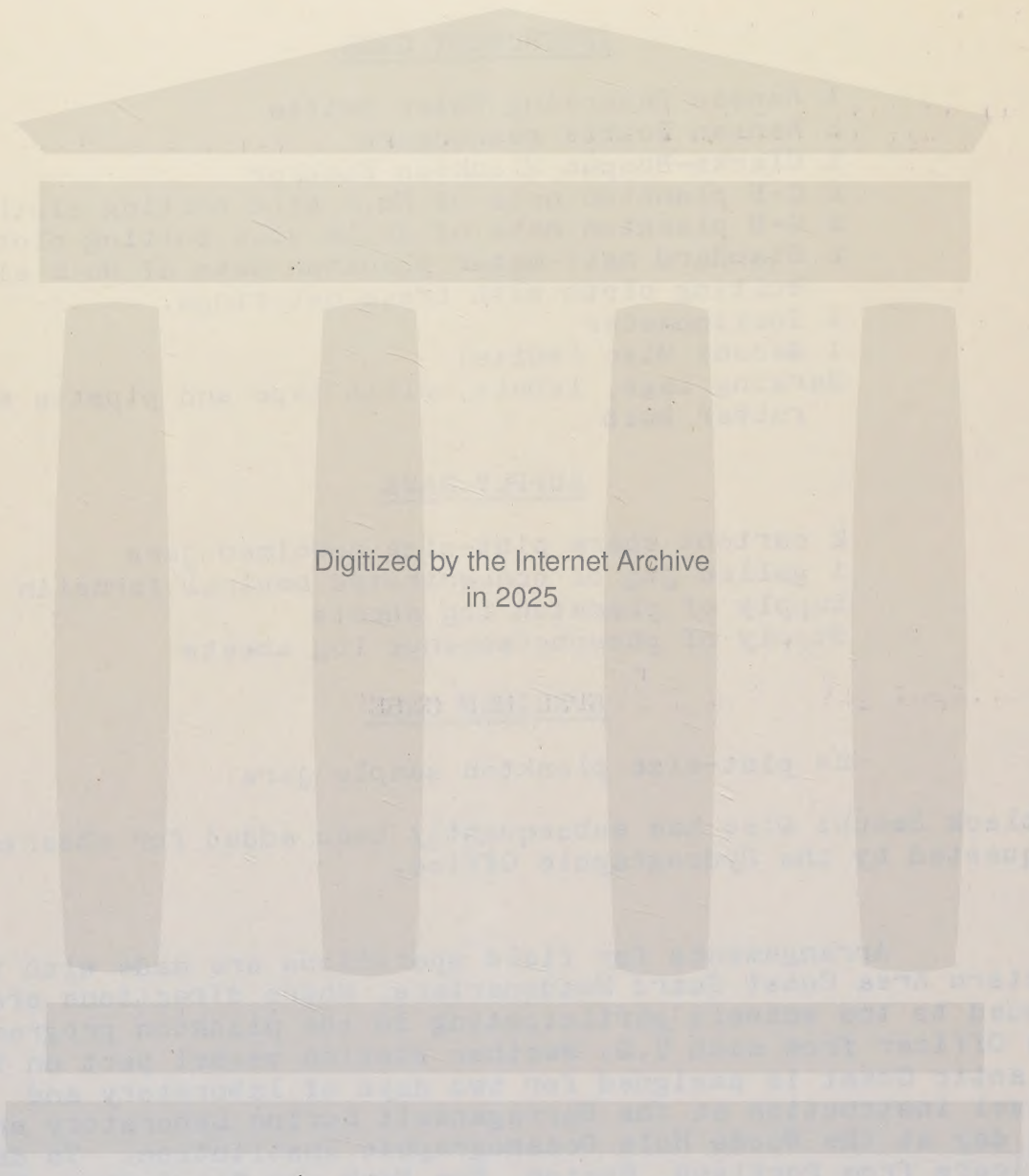
2 cartons spare pint-size specimen jars
1 gallon jug of concentrated neutral formalin
Supply of plankton log sheets
Supply of phosphorescence log sheets

SPECIMEN CASE

24 pint-size plankton sample jars

A black Secchi Disc has subsequently been added for observations requested by the Hydrographic Office.

5. Arrangements for field operations are made with the Eastern Area Coast Guard Headquarters, where directions are issued to the vessels participating in the plankton program. One Officer from each U.S. weather station vessel port on the Atlantic Coast is assigned for two days of laboratory and vessel instruction at the Narragansett Marine Laboratory and one day at the Woods Hole Oceanographic Institution. To date, officers from Portland, Boston, New York and Wilmington, North Carolina, have been indoctrinated. They will serve as instructors for officers on other vessels based at their respective ports.



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6. Weekly observations are made at Stations Baker (56°30'N 51°30'W) and Easy (35°00'N 48°00'W) at 1100, ships' time, or as near thereto as vessel routine permits, and not more than one hour from the time of the nearest routine bathythermograph reading. All assigned duties are carried out at this time except the half-meter surface net haul and phosphorescence observations which are made at night, at least one hour after the arrival of total darkness.

7. Each vessel remains on station for three weeks and records are entered on Plankton (Encl.A) and Luminescence (Encl.B) Log Sheets. The latter are filled out at least weekly on station and once each night while enroute to and from the station. Upon return to port the PLANKTON SAMPLE CASE is shipped to the Narragansett Marine Laboratory and the INSTRUMENT and SUPPLY CASES are transferred directly to the vessel scheduled to depart next for the station from which the vessel making the shipment has just returned. The PLANKTON SAMPLE CASE, with empty containers, is sent to this vessel from the Narragansett Laboratory. There are thus two three-case sets of equipment assigned to each station and used alternately. Where the return of a vessel is so delayed that she cannot reach port before the next designated vessel leaves for her station, a reserve set will be supplied from Woods Hole. Two such sets are held in readiness. One of these will also be temporarily assigned to the Canadian vessel when she occupies Station Baker. The seventh set is held in Kingston for use in Officer training.

8. Field work began at Station Easy on 15 February and at Station Baker on 25 February. To date plankton samples with accompanying records have been received from two vessels occupying Station Easy and one from Station Baker. Zooplankton samples are assigned to the Narragansett Marine Laboratory for analysis and phytoplankton to the Bingham Oceanographic Laboratory.

TRAINING

9. The training program is progressing according to plan, and will continue at Kingston until 1 June when the staff will transfer to the Narragansett Laboratory field station at Fort Kearney. There, a separate laboratory building is being prepared for use by the eight graduate student assistants.

BIBLIOGRAPHIC CARD INDEX

10. The bibliographic file of more than 10,000 titles on Pacific oceanography, compiled during the period of the Pacific Oceanic Biology Project (1946-49) is now being expanded to include the Atlantic and Arctic. During the past quarter approximately 5,000 titles have been added by Mrs. Mary Curtis Cobb, who is also maintaining the Pacific Index up to date.

PERSONNEL

11.

Name	Title	Total Man Days*
Charles J. Fish	Senior Biologist, in charge (quarter time)	16.25
Marie P. Fish	Associate Biologist	65
Mary C. Cobb	Secretary-Technician	65
	Graduate student assistants(8)	207
	Total Man Days	353.25

*Man day consists of 8 working hours.

NKTON LOG SHEET

WOODS HOLE OCEANOGRAPHIC INSTITUTION
AND
NARRAGANSETT MARINE LABORATORY

(ZEBRA TIME)

ION	VESSEL	DEPTH	OBSERVER
	LAT. LONG.	WEATHER	TRANSPARENCY
	CURRENT DIRECTION (TRUE) FORCE	WIND DIRECTION (TRUE) FORCE	B-T SLIDE NO.

INSTRUMENT	SAMPLE NO.	B-T SLIDE	DESIRED DEPTH FMS	ACTUAL DEPTH FMS	TIME DOWN	TIME UP	C-B READINGS DOWN	C-B READINGS UP
AMPLER (NO.2 SILK)	C-B 2	C-B 2	80-0					
AMPLER (NO.12 SILK)	C-B 12	C-B 12	80-0					
METER NET (NO. 2 SILK)	T 1	SURFACE						
NANSEN BOTTLE	N 1		0		(OMIT NANSEN SAMPLE N 5 (80 FMS.) AT STATION BAKER)			
	N 2		14		REMARKS:			
	N 3		27					
	N 4	N 4	55					
	N 5		80					

	LAT. LONG.	WEATHER	TRANSPARENCY
	CURRENT DIRECTION (TRUE) FORCE	WIND DIRECTION (TRUE) FORCE	B-T SLIDE NO.

INSTRUMENT	SAMPLE NO.	B-T SLIDE	DESIRED DEPTH FMS	ACTUAL DEPTH FMS	TIME DOWN	TIME UP	C-B READINGS DOWN	C-B READINGS UP
AMPLER (NO. 2 SILK)	C-B 2	C-B 2	80-0					
AMPLER (NO. 12 SILK)	C-B 12	C-B 12	80-0					
METER NET (NO. 2 SILK)	T 1	SURFACE						
NANSEN BOTTLE	N 1		0		(OMIT NANSEN SAMPLE N 5 (80 FMS.) AT STATION BAKER)			
	N 2		14		REMARKS:			
	N 3		27					
	N 4	N 4	55					
	N 5		80					

	LAT. LONG.	WEATHER	TRANSPARENCY
	CURRENT DIRECTION (TRUE) FORCE	WIND DIRECTION (TRUE FORCE	B-T SLIDE NO.

INSTRUMENT	SAMPLE NO.	B-T SLIDE	DESIRED DEPTH FMS	ACTUAL DEPTH FMS	TIME DOWN	TIME UP	C-B READINGS DOWN	C-B READINGS UP
MPLER (NO. 2 SILK)	C-B 2	C-B 2	80-0					
MPLER (NO. 12 SILK)	C-B 12	C-B 12	80-0					
TER NET (NO. 2 SILK)	T 1	SURFACE						
NANSEN BOTTLE	N 1		0		(OMIT NANSEN SAMPLE N 5 (80 FMS.) AT STATION BAKER)			
	N 2		14		REMARKS:			
	N 3		27					
	N 4	N 4	55					
	N 5		80					

HOSPHORESCENCE LOG SHEET

WOODS HOLE OCEANOGRAPHIC INSTITUTION
and
NARRAGANSETT MARINE LABORATORY

n reporting, circle applicable items in the two columns, and where possible amplify under remarks.

ESSEL	OBSERVER (Name and rank)
NROUTE	WEATHER SHIP STATION
FROM TOWARD	

ATE	TIME	LATITUDE	LONGITUDE

EATHER	WIND		CURRENT	
	Direction (true)	Force	Direction (true)	Force

PHOSPHORESCENCE

FREQUENCY		DISTRIBUTION	
	No phosphorescence.	0.	No phosphorescence.
	Disturbed water mass glows momentarily (milky), no detectable pin-point flashes.	1.	Only in bow or screw wakes.
	Occasional pin-point flashes.	2.	Patches.
	Frequent pin-point flashes.	3.	Streaks.
	Continuous pin-point flashes.	4.	Continuous over sea surface.
	Occasional large flashes.	5.	Tide rips.
	Frequent large flashes.	6.	Breakers.
	Continuous large flashes.	7.	In night plankton sample.
.	Occasional to frequent large and pin-point flashes.	8.	
.	Continuous pin-point and large flashes.	9.	

REMARKS

(Record any additional observations in the space provided below.)

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Woods Hole Oceanographic Institution

JUN 21 1957